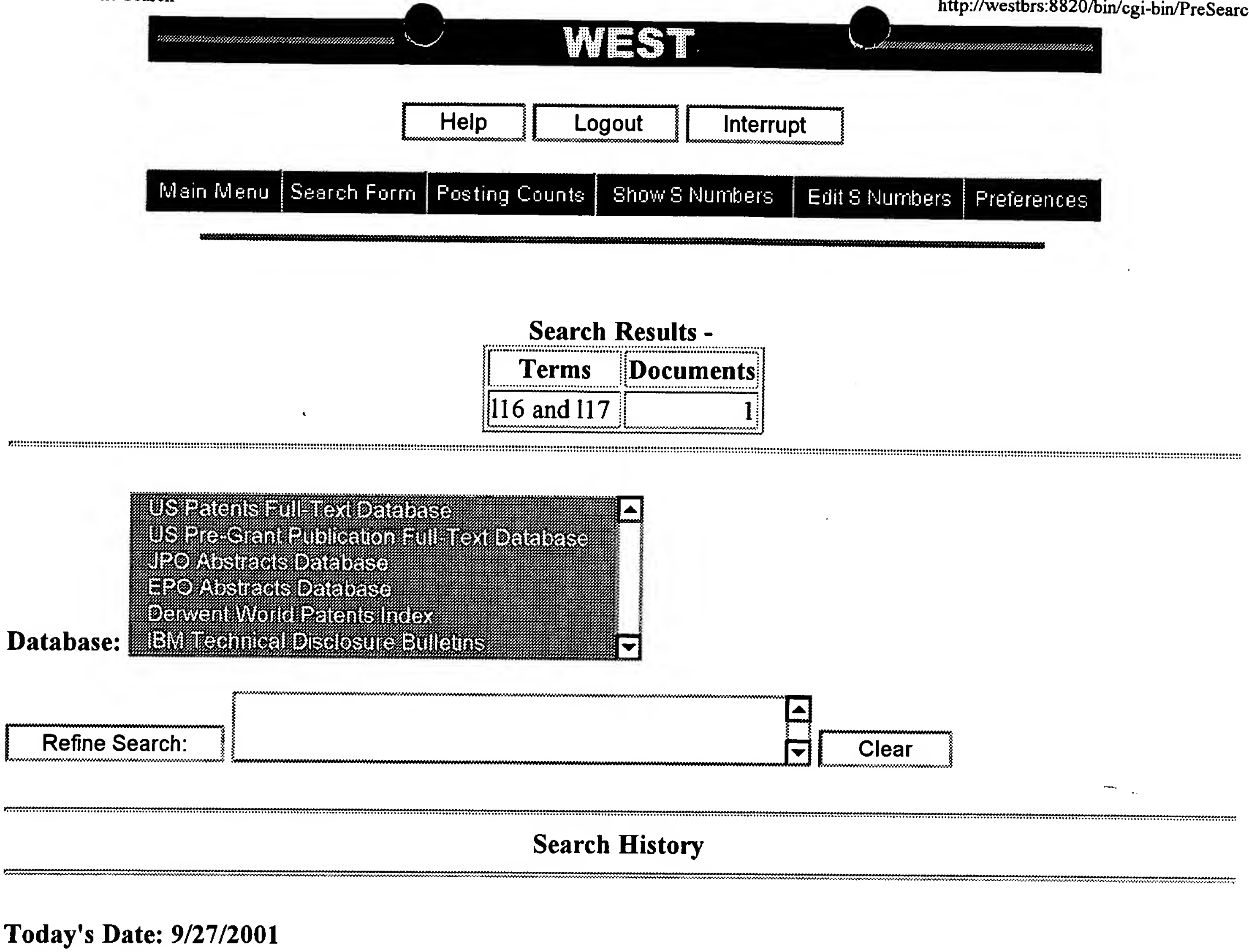

Search Results -

Terms	Documents
l16 and l17	1

Database:

- US Patents Full-Text Database
- US Pre-Grant Publication Full-Text Database
- JPO Abstracts Database
- EPO Abstracts Database
- Derwent World Patents Index
- IBM Technical Disclosure Bulletins

Search History

Today's Date: 9/27/2001

DB Name	Query	Hit Count	Set Name
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l16 and l17	1	L27
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l15 and l17	0	L26
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l14 and l17	3	L25
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l13 and l17	5	L24
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l12 and l17	0	L23
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l11 and l17	4	L22
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l10 and l17	7	L21
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l9 and l17	1	L20
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l8 and l17	7	L19
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l7 and l17	1	L18
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	tablespace with recovery	15	L17
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	(((707/7)!.CCLS.))	434	L16
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	(((707/1)!.CCLS.))	1160	L15
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	(((707/203)!.CCLS.))	507	L14
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	(((707/204)!.CCLS.))	381	L13
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	(((707/100)!.CCLS.))	828	L12
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	(((707/200)!.CCLS.))	695	L11
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	(((707/101)!.CCLS.))	736	L10
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	(((707/201)!.CCLS.))	493	L9
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	(((707/202)!.CCLS.))	427	L8
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	((707/102)!.CCLS.)	948	L7
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	tablespace with recovery with system	2	L6
USPT	5937415.pn.	1	L5
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	db2 with tablespace	20	L4
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	database or db2	84482	L3
USPT	6044444.pn.	1	L2
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	database with tablespace	47	L1

WEST

Generate Collection

Search Results - Record(s) 1 through 20 of 20 returned.

□ 1. Document ID: US 20010016844 A1

L4: Entry 1 of 20 File: PGPB Aug 23, 2001

PGPUB-DOCUMENT-NUMBER: 20010016844
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20010016844 A1

TITLE: METHOD FOR MAINTAINING EXCEPTION TABLES FOR A CHECK UTILITY

PUBLICATION-DATE: August 23, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
ISIP, AMANDO B. JR.	RICHARDSON	TX	US	

US-CL-CURRENT: 707/7

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw. Desc | Image

□ 2. Document ID: US 6295539 B1

L4: Entry 2 of 20 File: USPT Sep 25, 2001

US-PAT-NO: 6295539
DOCUMENT-IDENTIFIER: US 6295539 B1

TITLE: Dynamic determination of optimal process for enforcing constraints

DATE-ISSUED: September 25, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Isip, Jr.; Amando B.	Richardson	TX	N/A	N/A

US-CL-CURRENT: 707/201; 707/100, 707/102, 707/2, 707/3, 707/8

Full | Title | Citation | Front | Review | Classification | Date | Reference | KWIC | Draw. Desc | Image

□ 3. Document ID: US 6289357 B1

L4: Entry 3 of 20 File: USPT Sep 11, 2001

US-PAT-NO: 6289357
DOCUMENT-IDENTIFIER: US 6289357 B1

TITLE: Method of automatically synchronizing mirrored database objects

DATE-ISSUED: September 11, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Parker; Christopher F.	Oswego	IL	N/A	N/A

US-CL-CURRENT: 707/202; 707/200, 707/201, 707/203, 707/204, 707/205, 707/206

Full | Title | Citation | Front | Review | Classification | Date | Reference   KWIC | Drawu Desc | Image

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□ 4. Document ID: US 6189010 B1

L4: Entry 4 of 20   File: USPT   Feb 13, 2001

US-PAT-NO: 6189010
DOCUMENT-IDENTIFIER: US 6189010 B1

TITLE: Method for repairing constraint violations in a database management system

DATE-ISSUED: February 13, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Isip, Jr.; Amando B.	Richardson	TX	N/A	N/A

US-CL-CURRENT: 707/100; 707/8

Full | Title | Citation | Front | Review | Classification | Date | Reference   KWIC | Drawu Desc | Image

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□ 5. Document ID: US 6178427 B1

L4: Entry 5 of 20   File: USPT   Jan 23, 2001

US-PAT-NO: 6178427
DOCUMENT-IDENTIFIER: US 6178427 B1

TITLE: Method of mirroring log datasets using both log file data and live log data including gaps between the two data logs

DATE-ISSUED: January 23, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Parker; Christopher F.	Oswego	IL	N/A	N/A

US-CL-CURRENT: 707/202; 707/203, 707/204

Full | Title | Citation | Front | Review | Classification | Date | Reference   KWIC | Drawu Desc | Image

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□ 6. Document ID: US 6115722 A

L4: Entry 6 of 20   File: USPT   Sep 5, 2000

US-PAT-NO: 6115722
DOCUMENT-IDENTIFIER: US 6115722 A

TITLE: Method for checking tablespaces involved in referential integrity

DATE-ISSUED: September 5, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Isip, Jr.; Amando B.	Richardson	TX	N/A	N/A
Parker; Christopher F.	Oswego	IL	N/A	N/A
Weaver; Stephen J.	Lisle	IL	N/A	N/A

US-CL-CURRENT: 707/202; 707/101, 707/102, 707/201, 707/7, 717/1

Full | Title | Citation | Front | Review | Classification | Date | Reference   KWIC | Draw Desc | Image

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□ 7. Document ID: US 6115704 A

L4: Entry 7 of 20   File: USPT   Sep 5, 2000

US-PAT-NO: 6115704
DOCUMENT-IDENTIFIER: US 6115704 A

TITLE: Extended SQL change definition language for a computer database system

DATE-ISSUED: September 5, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Olson; Jack Edward	Austin	TX	N/A	N/A
Elliott; Linda Carolyn	Austin	TX	N/A	N/A

US-CL-CURRENT: 707/3

Full | Title | Citation | Front | Review | Classification | Date | Reference   KWIC | Draw Desc | Image

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□ 8. Document ID: US 6070170 A

L4: Entry 8 of 20   File: USPT   May 30, 2000

US-PAT-NO: 6070170
DOCUMENT-IDENTIFIER: US 6070170 A

TITLE: Non-blocking drain method and apparatus used to reorganize data in a database

DATE-ISSUED: May 30, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Friske; Craig Alan	San Jose	CA	N/A	N/A
Sockut; Gary Howard	San Jose	CA	N/A	N/A
Teng; James Zu-Chia	San Jose	CA	N/A	N/A
Turnbaugh; Stephen Walter	Hollister	CA	N/A	N/A

US-CL-CURRENT: 707/202; 707/200, 707/201, 714/1

Full | Title | Citation | Front | Review | Classification | Date | Reference   KWIC | Draw Desc | Image

□ 9. Document ID: US 5887274 A

L4: Entry 9 of 20 File: USPT Mar 23, 1999

US-PAT-NO: 5887274
DOCUMENT-IDENTIFIER: US 5887274 A

TITLE: Restartable fast DB2 tablespace reorganization method

DATE-ISSUED: March 23, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Barry; Richard E.	Houston	TX	N/A	N/A
Al-eisa; Eisa A.	Houston	TX	N/A	N/A

US-CL-CURRENT: 707/202; 707/101

Full | Title | Citation | Front | Review | Classification | Date | Reference   KWIC | Draw Desc | Image

□ 10. Document ID: US 5778350 A

L4: Entry 10 of 20 File: USPT Jul 7, 1998

US-PAT-NO: 5778350
DOCUMENT-IDENTIFIER: US 5778350 A

TITLE: Data collection, processing, and reporting system

DATE-ISSUED: July 7, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Adams; Raymond J.	Frisco	TX	N/A	N/A
Brichta; Harriet E.	Plano	TX	N/A	N/A
Henn; Roger J.	Lucas	TX	N/A	N/A
Hollander; Drew A.	Rochester	NY	N/A	N/A
Adas; Robert W.	McKinney	TX	N/A	N/A
Dolan; Gerald R.	Melissa	TX	N/A	N/A
Bermender; Donna M.	Leander	TX	N/A	N/A
Hawthorne; William D.	Plano	TX	N/A	N/A

US-CL-CURRENT: 707/1; 707/102

Full | Title | Citation | Front | Review | Classification | Date | Reference   KWIC | Draw Desc | Image

□ 11. Document ID: US 5758357 A

L4: Entry 11 of 20 File: USPT May 26, 1998

US-PAT-NO: 5758357
DOCUMENT-IDENTIFIER: US 5758357 A

TITLE: Fast DB2 tablespace reorganization method that is restartable after interruption of the process

DATE-ISSUED: May 26, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Barry; Richard E.	Houston	TX	N/A	N/A
Aleisa; Eisa A.	Houston	TX	N/A	N/A

US-CL-CURRENT: 707/202; 707/101

Full | Title | Citation | Front | Review | Classification | Date | Reference   KWIC | Draw Desc | Image

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□ 12. Document ID: US 5692182 A

L4: Entry 12 of 20   File: USPT   Nov 25, 1997

US-PAT-NO: 5692182
DOCUMENT-IDENTIFIER: US 5692182 A

TITLE: Bufferpool coherency for identifying and retrieving versions of workfile data using a producing DBMS and a consuming DBMS

DATE-ISSUED: November 25, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Desai; Paramesh Sampatrai	San Jose	CA	N/A	N/A
Smith; Bryan Frederick	Morgan Hill	CA	N/A	N/A
Teng; James Zu-chia	San Jose	CA	N/A	N/A
Yang; Kou Horng Allen	San Jose	CA	N/A	N/A

US-CL-CURRENT: 707/10; 707/1, 707/202

Full | Title | Citation | Front | Review | Classification | Date | Reference   KWIC | Draw Desc | Image

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□ 13. Document ID: US 5692174 A

L4: Entry 13 of 20   File: USPT   Nov 25, 1997

US-PAT-NO: 5692174
DOCUMENT-IDENTIFIER: US 5692174 A

TITLE: Query parallelism in a shared data DBMS system

DATE-ISSUED: November 25, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bireley; William Robert	Morgan Hill	CA	N/A	N/A
Dang; Tammie	San Jose	CA	N/A	N/A
Desai; Paramesh Sampatrai	San Jose	CA	N/A	N/A
Haderle; Donald James	Los Gatos	CA	N/A	N/A
Lin; Fen-Ling	San Jose	CA	N/A	N/A
McDevitt; Maureen Mae	San Jose	CA	N/A	N/A
Shibamiya; Akira	Los Altos	CA	N/A	N/A
Smith; Bryan Frederick	Morgan Hill	CA	N/A	N/A
Teng; James Zu-chia	San Jose	CA	N/A	N/A
Tie; Hong Sang	Morgan Hill	CA	N/A	N/A
Wang; Yun	Saratoga	CA	N/A	N/A
Wong; Jerome Quan	Mountain View	CA	N/A	N/A
Zeidenstein; Kathryn Ruth	Chicago	IL	N/A	N/A
Yang; Kou Horng Allen	Santa Clara	CA	N/A	N/A

US-CL-CURRENT: 707/3; 707/2

Full | Title | Citation | Front | Review | Classification | Date | Reference   KWIC | Draw. Desc | Image

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□ 14. Document ID: US 5517641 A

L4: Entry 14 of 20   File: USPT   May 14, 1996

US-PAT-NO: 5517641
DOCUMENT-IDENTIFIER: US 5517641 A

TITLE: Restartable method to reorganize DB2 tablespace records by determining new physical positions for the records prior to moving using a non sorting technic

DATE-ISSUED: May 14, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Barry; Richard E.	Houston	TX	N/A	N/A
ALeisa; Eisa A.	Houston	TX	N/A	N/A

US-CL-CURRENT: 707/101

Full | Title | Citation | Front | Review | Classification | Date | Reference   KWIC | Draw. Desc | Image

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□ 15. Document ID: US 5408654 A

L4: Entry 15 of 20   File: USPT   Apr 18, 1995

US-PAT-NO: 5408654
DOCUMENT-IDENTIFIER: US 5408654 A

TITLE: Method to reorganize an index file without sorting by changing the physical order of pages to match the logical order determined from the index structure

DATE-ISSUED: April 18, 1995

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Barry; Richard E.	Houston	TX	N/A	N/A

US-CL-CURRENT: 707/101; 707/533

Full | Title | Citation | Front | Review | Classification | Date | Reference   KWIC | Draw Desc | Image

□ 16. Document ID: US 5396623 A

L4: Entry 16 of 20   File: USPT   Mar 7, 1995

US-PAT-NO: 5396623
DOCUMENT-IDENTIFIER: US 5396623 A

TITLE: Method for editing the contents of a DB.sub.2 table using an editproc manager

DATE-ISSUED: March 7, 1995

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
McCall; Annette B.	Houston	TX	N/A	N/A
Veazey, Jr.; Edward J.	Houston	TX	N/A	N/A

US-CL-CURRENT: 707/101; 707/200

Full | Title | Citation | Front | Review | Classification | Date | Reference   KWIC | Draw Desc | Image

□ 17. Document ID: US 5887274 A

L4: Entry 17 of 20   File: EPAB   Mar 23, 1999

PUB-NO: US005887274A
DOCUMENT-IDENTIFIER: US 5887274 A
TITLE: Restartable fast DB2 tablespace reorganization method

PUBN-DATE: March 23, 1999

INVENTOR-INFORMATION:

NAME	COUNTRY
BARRY, RICHARD E	US
AL-EISA, EISA A	US

INT-CL (IPC): G06F 17/30

Full | Title | Citation | Front | Review | Classification | Date | Reference   KWIC | Draw Desc | Image

□ 18. Document ID: US 5758357 A

```
L4: Entry 18 of 20                          File: EPAB                    May 26, 1998

PUB-NO: US005758357A
DOCUMENT-IDENTIFIER: US 5758357 A
TITLE: Fast DB2 tablespace reorganization method that is restartable after interruption
of the process

PUBN-DATE: May 26, 1998

INVENTOR-INFORMATION:
NAME                                               COUNTRY
BARRY, RICHARD E                                   US
ALEISA, EISA A                                     US

INT-CL (IPC): G06F 17/30
EUR-CL (EPC): G06F007/24; G06F017/30
```

Full | Title | Citation | Front | Review | Classification | Date | Reference   KWIC | Draw Desc | Clip Img | Image

□ 19. Document ID: US 5517641 A

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L4: Entry 19 of 20                          File: EPAB                    May 14, 1996

PUB-NO: US005517641A
DOCUMENT-IDENTIFIER: US 5517641 A
TITLE: Restartable method to reorganize DB2 tablespace records by determining new
physical positions for the records prior to moving using a non sorting technic

PUBN-DATE: May 14, 1996

INVENTOR-INFORMATION:
NAME                                               COUNTRY
BARRY, RICHARD E                                   US
ALEISA, EISA A                                     US

INT-CL (IPC): G06F 7/24; G06F 17/30
EUR-CL (EPC): G06F017/30; G06F007/22
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Full | Title | Citation | Front | Review | Classification | Date | Reference   KWIC | Draw Desc | Image

□ 20. Document ID: NN940391

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L4: Entry 20 of 20                          File: TDBD                    Mar 1, 1994
```

TDB-ACC-NO: NN940391

DISCLOSURE TITLE: Single-Source Reference/Multiple Table Access via DB2 Synonyms

PUBLICATION-DATA:
IBM Technical Disclosure Bulletin, March 1994, US

VOLUME NUMBER: 37
ISSUE NUMBER: 3
PAGE NUMBER: 91 - 92

Full | Title | Citation | Front | Review | Classification | Date | Reference   KWIC | Draw. Desc | Image

Generate Collection

Terms	Documents
db2 with tablespace	20

Display 40 Documents, starting with Document: 20

Display Format: CIT Change Format

WEST

□ Generate Collection

L4: Entry 11 of 20 File: USPT May 26, 1998

US-PAT-NO: 5758357
DOCUMENT-IDENTIFIER: US 5758357 A

TITLE: Fast DB2 tablespace reorganization method that is restartable after interruption of the process

DATE-ISSUED: May 26, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Barry; Richard E.	Houston	TX	N/A	N/A
Aleisa; Eisa A.	Houston	TX	N/A	N/A

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
DBC Software, Inc.	Houston	TX	N/A	N/A	02

APPL-NO: 8/ 588862
DATE FILED: January 19, 1996

PARENT-CASE:
This is a division of application Ser. No. 08/163,091 filed Dec. 7, 1993 now U.S. Pat. No. 5,517,641, which was a continuation in part of application Ser. No. 07/889,454 filed May 27, 1992 now U.S. Pat. No. 5,408,654.

INT-CL: [6] G06F 17/30
US-CL-ISSUED: 707/202; 707/101
US-CL-CURRENT: 707/202; 707/101
FIELD-OF-SEARCH: 395/611, 395/612, 395/616, 395/618, 395/617, 395/621

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected | Search ALL

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
□	4679139	July 1987	Durbin	395/601
□	4890226	December 1989	Itoh	395/417
□	5034914	July 1991	Osterlund	395/872
□	5121493	June 1992	Ferguson	395/607
□	5204958	April 1993	Cheng	395/613
□	5222235	June 1993	Hintz	395/612
□	5257362	October 1993	Menon	395/441
□	5274805	December 1993	Ferguson	395/607

OTHER PUBLICATIONS

Walker, H., Introduction to Computing and Computer Science with Pascal, pp. 246-247, Jan. 1986.
Hauser et al., "DB2 2.3 Reorg Tablespace Performance," DB Journal, Aug. 1992, pp. 24-29.

IBM DB2 Utilities Guide, Re[illegible] Chap, pp. 103-114.
IBM DB2 Command and Utility Reference, pp. 266-272, Reorg Utility.
Platinum, Put User Guide, pp. 4-1 to 4-10, 1992.

ART-UNIT: 237
PRIMARY-EXAMINER: Black; Thomas G.
ASSISTANT-EXAMINER: Choules; Jack M.
ATTY-AGENT-FIRM: Pravel, Hewitt, Kimball & Krieger

ABSTRACT:

An improved method to dramatically reduce the time required to reorganize DB2 tablespaces and index files by not utilizing conventional sort techniques. Viewing access is allowed during the reorganization process by setting the files to read only status. The process is basically non-destructive, allowing a prompt return to the original state, and is checkpointed, allowing restarting at selected intervals. Briefly, the original table and indices are considered as A files and read into memory. New row IDs or RIDs are developed using a non-sorting technique so that the proper order of the data is developed. After the new RIDs have been developed, both the clustering index and the row data are read out of memory and written to a new table and clustering index files in the proper order as B files. All of the table files are then stopped to allow exclusive access. Next, a series of AMS statements are built to do the renaming operations. Specifically, a series of statements are built to rename all of the A files to X files, to rename all B files to A files and then to delete all of the X files. Then any remaining non-clustering indices are reorganized using non-sorting techniques and renamed in a similar fashion.

6 Claims, 47 Drawing figures

WEST

□ Generate Collection

L19: Entry 3 of 7 File: USPT Mar 30, 1999

US-PAT-NO: 5890167
DOCUMENT-IDENTIFIER: US 5890167 A

TITLE: Pluggable tablespaces for database systems

DATE-ISSUED: March 30, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bridge, Jr.; William H.	Alameda	CA	N/A	N/A
Klein; Jonathan D.	Pleasanton	CA	N/A	N/A
Lee; J. William	Foster City	CA	N/A	N/A
Loaiza; Juan R.	San Carlos	CA	N/A	N/A
Tsukerman; Alex	Foster City	CA	N/A	N/A
Putzolu; GianFranco	San Francisco	CA	N/A	N/A

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Oracle Corporation	Redwood Shores	CA	N/A	N/A	02

APPL-NO: 8/ 852968
DATE FILED: May 8, 1997

INT-CL: [6] G06F 17/30
US-CL-ISSUED: 707/204; 707/101, 707/202, 707/203
US-CL-CURRENT: 707/204; 707/101, 707/202, 707/203
FIELD-OF-SEARCH: 707/204, 707/1-4, 707/100, 707/101, 707/202, 707/203

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected Search ALL

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
□	5222235	June 1993	Hintz et al.	707/101
□	5396623	March 1995	Hintz et al.	707/101
□	5579516	November 1996	Van Maren et al.	707/1

ART-UNIT: 271
PRIMARY-EXAMINER: Black; Thomas G.
ASSISTANT-EXAMINER: Alam; Hosain T.
ATTY-AGENT-FIRM: McDermott, Will & Emery

ABSTRACT:

A pluggable tablespace is enabled by logically partitioning a database into a set of tablespaces and storing all of the tablespaces disk pointers in tablespace-relative format. A pluggable set of tablespaces is unplugged by exporting the associated metadata, and making a binary copy of the tablespaces. The pluggable set of tablespaces is plugged into a target database by making the pluggable set accessible to the target database and importing the associated metadata, without patching any of the disk pointers.

24 Claims, 20 Drawing figures

24 Claims, 20 Drawing figure

WEST

□ Generate Collection

L4: Entry 10 of 20 File: USPT Jul 7, 1998

DOCUMENT-IDENTIFIER: US 5778350 A
TITLE: Data collection, processing, and reporting system

DEPR:
Referring to FIG. 3, the collector main task processing is shown beginning in block 60. Collector 20 is preferably a batch program that reads one or more input files and writes information derived from the input data to one or more output tables. To maximize throughput, collector 20 is a multi-tasking program that initiates a separate input task for each input file. Collector 20 dynamically creates and alters any needed database object including databases, tablespaces, tables, indexes, views, and grants. Tablespace is defined in DB2, for example, as the physical spaces that holds tables. Database is defined in DB2, for example, as a collection of one or more tablespaces. Collector 20 may be run as soon as any input file becomes available or throughout the day as often as desired. The collector main task begins by interpreting and validating execution parameters, as shown in block 62. The program execution parameters control the operation of collector 20 including all input subtasks. The execution parameters can be specified either in the PARM keyword on the EXEC statement in the collector JCL (job control language), or it can be specified on the PROGRAM parameter card in a PARMS SYSIN file. An exemplary list of execution parameters includes the following:

WEST

End of Result Set

□ Generate Collection

L6: Entry 2 of 2 File: DWPI Jan 30, 2001

DERWENT-ACC-NO: 2001-147219
DERWENT-WEEK: 200127
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TITLE: Recovery system for database table, receives backup copy of tablespace, reads/applies log records associated with table to backup copy and builds new table data pages

INVENTOR: PARKER, C F

PATENT-ASSIGNEE: COMPUTER ASSOC THINK INC (COMPN)

PRIORITY-DATA: 1999US-0349198 (July 7, 1999)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
AU 200057626 A	January 30, 2001	N/A	000	G06F017/30
WO 200104797 A1	January 18, 2001	E	015	G06F017/30

DESIGNATED-STATES: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TZ UG ZW

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
AU 200057626A	June 23, 2000	2000AU-0057626	N/A
AU 200057626A		WO 200104797	Based on
WO 200104797A1	June 23, 2000	2000WO-US17350	N/A

INT-CL (IPC): G06F 17/30

ABSTRACTED-PUB-NO: WO 200104797A
BASIC-ABSTRACT:

NOVELTY - Backup copy of the tablespace is received, the log records associated with a first table is read. The sorted log records are applied to the backup copy and new table data pages are built from the backup copy. The new table is scanned for records of the first table and the first table updated from the records. the second table is limited to read-only before the first table is updated.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a method of recovering a table of a database.

USE - For database table that depends on tablespace.

ADVANTAGE - The system does not require the tablespace from which the table depends and all other tables that depend from the tablespace to be reconstructed.

DESCRIPTION OF DRAWING(S) - The figure shows block diagram of a table recovery system.

Backup copy System 202

Log Records 204

Data Page Updater System 212

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ABSTRACTED-PUB-NO: WO 20010[illegible]7A
EQUIVALENT-ABSTRACTS:

CHOSEN-DRAWING: Dwg.2/2

DERWENT-CLASS: T01
EPI-CODES: T01-J05B4M;
```

Search History for colbert

File		Status	Query	Database	Hits	Time
□	5		database	PCT-392001	45	27.09.2001 13:57:34
□	4		(database AND recovery)	PCT-392001	0	27.09.2001 13:57:24
□	3		(database AND table)	PCT-392001	0	27.09.2001 13:57:07
□	2		((database AND table) AND recovery)	PCT-392001	0	27.09.2001 13:56:52
□	1		((((database AND table) AND recovery) OR recovery) AND system)	PCT-392001	5	27.09.2001 13:56:14

Delete Entries | Mark Entries: Save | Mark Entries: Update | Update Marked Entries

Marking an entry already marked *Save* or *Update* will remove the mark for that entry.

[Search Summary]

Results of searching in PCT-392001 for:
database: 45 records
Showing records 1 *to* 25 *of* 45 :

Final 20 records   Start At

Refine Search   database

Title

1. **(WO 01/72064)** GAME PROGRAM DOWNLOADING SYSTEM AND METHOD FOR MOBILE TERMINAL
2. **(WO 01/72060)** LOCATION DETERMINATION USING RF FINGERPRINTING
3. **(WO 01/72055)** PRESENCE REGISTRATION AND ROUTING NODE
4. **(WO 01/72025)** METHOD, SYSTEM, AND COMPUTER PROGRAM PRODUCT FOR MANAGING ROUTING AND ***DATABASE*** SERVERS AND SERVICES
5. **(WO 01/72012)** SYSTEM AND METHOD FOR INEXPENSIVELY PROVIDING SECURITY AND AUTHENTICATION OVER A COMMUNICATIONS CHANNEL
6. **(WO 01/71978)** COMPUTER EQUIPMENT FOR SUPERVISION OF COMPUTER OR TELECOMMUNICATION EQUIPMENT, NETWORK AND SERVICES
7. **(WO 01/71973)** SYSTEM AND METHOD OPERATING AS AN AGENCY FOR ENABLING REGISTRATION AND LOGIN
8. **(WO 01/71954)** NETWORK NAVIGATION METHODS, SYSTEMS, AND ARTICLES USING A PRINTED PUBLICATION
9. **(WO 01/71692)** A REMOTE ASSISTANCE AND MANAGEMENT SYSTEM FOR HOUSEHOLD APPLIANCES OF VARIOUS TYPOLOGIES SUPPLIED WITH ENERGY FROM THE ELECTRICITY MAINS, IN PARTICULAR GAS BOILERS FOR HEATING PURPOSES
10. **(WO 01/71672)** AUTOMATIC TRADING DEVICE, AUTOMATIC TRADING SYSTEM, AND AUTOMATIC TRADING METHOD
11. **(WO 01/71660)** IMPROVEMENTS IN OR RELATING TO PROCESSING DATA FOR INTERPRETATION
12. **(WO 01/71638)** AN INTERNET STORAGE SERVICE SYSTEM AND METHOD
13. **(WO 01/71637)** ELECTRONIC DOCUMENT PROCESSING APPARATUS AND PROCESSING METHOD
14. **(WO 01/71633)** TRANSACTION HANDLING METHODS AND SYSTEMS
15. **(WO 01/71620)** SYSTEMS AND METHODS FOR COLLECTING CONSUMER DATA
16. **(WO 01/71615)** SYSTEMS AND METHODS FOR PROVIDING REMOTE SUPPORT VIA PRODUCTIVITY CENTERS
17. **(WO 01/71607)** MENU DRIVEN MANAGEMENT AND OPERATION TECHNIQUE

18. **(WO 01/71606)** INTERNET BASED WARRANTY AND REPAIR SERVICE
19. **(WO 01/71605)** APPARATUS AND METHODS FOR INTERACTIVE RENTAL INFORMATION RETRIEVAL AND MANAGEMENT
20. **(WO 01/71602)** NETWORK NAVIGATION METHODS, SYSTEMS, AND DATABASES FOR AN ARTICLE HAVING A PRODUCT CODE
21. **(WO 01/71597)** COMMODITY GUARANTEE SYSTEM AND METHOD FOR ELECTRONIC COMMERCE
22. **(WO 01/71594)** METHOD AND APPARATUS FOR FACILITATING COMMERCE BETWEEN BUYER AND SELLER
23. **(WO 01/71582)** A METHOD AND SYSTEM FOR EXCHANGING USERS RELATED INFORMATION VIA THEIR COMMUNICATION SYSTEMS
24. **(WO 01/71570)** DISTRIBUTED MULTIRESOLUTION GEOMETRY MODELING SYSTEM AND METHOD
25. **(WO 01/71564)** SYSTEM FOR PROVIDING INFORMATION TO AN INTERESTED VIEWER, AND METHOD OF USE THEREOF

Final 20 records   Start At □

Search Summary

database: 89 occurrences in 45 records.

Search Time: 0.01 seconds.

- [Search Summary]

Results of searching in PCT-392001 for:
database: 45 records
Showing records 26 *to* 45 *of* 45 :

First 25 records Start At

Refine Search database

Title

26. **(WO 01/71560)** METHOD FOR IDENTIFYING GLITTERING MATERIAL IN PAINT
27. **(WO 01/71558)** IMAGE RETRIEVAL/DISTRIBUTION SYSTEM AND IMAGE RETRIEVAL/DISTRIBUTION METHOD
28. **(WO 01/71539)** SYSTEM AND METHOD FOR AUTOMATICALLY FORWARDING EMAIL AND EMAIL EVENTS VIA A COMPUTER NETWORK TO A SERVER COMPUTER
29. **(WO 01/71523)** TRANSPARENT USER AND SESSION MANAGEMENT FOR WEB APPLICATIONS
30. **(WO 01/71499)** METHOD AND SYSTEM FOR DYNAMIC NETWORK INTRUSION MONITORING, DETECTION AND RESPONSE
31. **(WO 01/71498)** SERVER MONITORING USING VIRTUAL POINTS OF PRESENCE
32. **(WO 01/71479)** METHODS AND DEVICES FOR RECONSTRUCTING VISUAL STIMULI OBSERVED THROUGH BROWSER-BASED INTERFACES OVER TIME
33. **(WO 01/71469)** METHOD AND SYSTEM FOR ACCESSING MEDICAL INFORMATION
34. **(WO 01/71462)** SYSTEM AND METHOD FOR SECURE BIOMETRIC IDENTIFICATION
35. **(WO 01/71456)** ELECTRONIC COMMERCE SYSTEM AND METHODS WITH GLOBAL INFORMATION ACCESSIBLE AND WITH SPECIFIC INFORMATION AND CONTROL AVAILABLE
36. **(WO 01/71377)** METHOD AND SYSTEM FOR IDENTIFICATION OF SUBTERRANEAN OBJECTS
37. **(WO 01/71312)** APPARATUS AND METHOD FOR ELECTROPHYSIOLOGICAL TESTING
38. **(WO 01/50305)** METHOD AND SYSTEM FOR SUPERVISING ON-LINE PURCHASING
39. **(WO 01/40948)** METHOD AND SYSTEM FOR ENABLING OPTIONAL CUSTOMER ELECTION OF AUXILIARY CONTENT PROVIDED ON DETACHABLE LOCAL STORAGE MEDIA
40. **(WO 01/33515)** SYSTEM AND METHOD FOR ALLOCATING SHARES IN AN OFFERING
41. **(WO 01/22326)** SYSTEM AND METHOD FOR ADMINISTERING A COMMUNICATION NETWORK BASED AUCTION
42. **(WO 01/20435)** USE OF ENGLISH PHONETICS TO WRITE NON-ROMAN CHARACTERS

CHARACTERS

43. **(WO 01/11444)** SYSTEM AND METHOD FOR SEARCHING AND INDEXING WORLD-WIDE-WEB PAGES
44. **(WO 00/34886)** DYNAMIC QUALITY CONTROL CONDITIONAL PURCHASE OFFER (CPO) MANAGEMENT SYSTEM
45. **(WO 99/64974)** A MONITORING SYSTEM

First 25 records Start At

Search Summary

database: 89 occurrences in 45 records.

Search Time: 0.01 seconds.

▲

◀ ▶ ▲ Presentatio Basic ▾ Image: Small ▾ Français

6 of 15

View Images

PUBLISHED INTERNATIONAL APPLICATION

(11) **WO 01/04797** (13) A1

(21) PCT/US00/17350

(22) **23 June 2000 (23.06.2000)**

(25) ENG (26) ENG

(31) 09/349,198 (32) **07 July 1999 (07.07.1999)** (33) US

(43) 18 January 2001 (18.01.2001)

(51)7 G06F 17/30

(54) ***DATABASE TABLE*** RECOVERY SYSTEM

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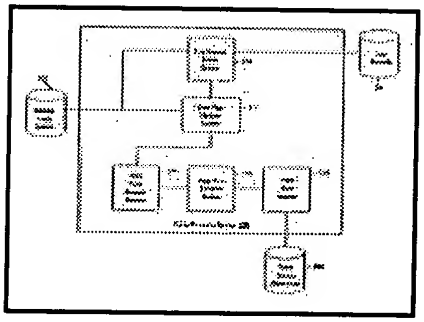
(81) AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW ; AP (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW); EA (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM); EP (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE); OA (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG)

Abstract



A system and method for recovering a ***database table*** (200) that depends on a tablespace (206) receives a backup copy (202) of the tablespace (206) and reads log records (204) associated with the table (200). The system then applies the log records (204) to the backup copy (202) and builds new table data pages from the backup copy (202). Finally, the system scans (214) the new table data pages for records of the first table and updates the table from the records.

Searching PCT.vdb...

[Search Summary]

Results of searching in PCT.vdb for:

"database table": 15 records

Showing records 1 *to* 15 *of* 15 :

Refine Search "database table"

Title

1. (WO 01/50224) METHODS AND SYSTEMS FOR ACCESSING INFORMATION AND SERVICES ON A COMPUTER NETWORK
2. (WO 01/48638) DATABASE MANAGEMENT SYSTEM AND METHOD FOR DATABASES HAVING LARGE OBJECTS
3. (WO 01/44895) COMPUTER-BASED TECHNIQUES FOR STORING AND PROCESSING DATA
4. (WO 01/27815) SEARCH ENGINE
5. (WO 01/06417) A DATABASE SYSTEM FOR VIEWING EFFECTS OF CHANGES TO A INDEX FOR A QUERY OPTIMIZATION PLAN
6. (WO 01/04797) ***DATABASE TABLE*** RECOVERY SYSTEM
7. (WO 00/31635) METHOD AND APPARATUS FOR CONCURRENT DBMS TABLE OPERATIONS
8. (WO 00/13111) METHOD AND APPARATUS FOR FAST AND COMPREHENSIVE DBMS ANALYSIS
9. (WO 99/53713) SYSTEM AND METHOD FOR FACILITATING INTER-NODAL PROTOCOL AGREEMENT IN A TELECOMMUNICATIONS SYSTEM
10. (WO 99/48029) PERSPECTIVE TRANSFORMATIONS ON RELATIONAL DATABASE TABLES
11. (WO 99/45486) METHOD FOR COMPUTERIZED SUPPLY CHAIN PLANNING
12. (WO 98/57272) DEVICE FOR DATA ANALYSIS AND ORGANISATION
13. (WO 98/54662) METHOD, COMPUTER PROGRAM PRODUCT, AND SYSTEM FOR DISTRIBUTING CHANGES MADE IN A DATA STORE TO REMOTE CLIENT COPIES OF THE DATA STORE
14. (WO 98/52131) METHOD AND APPARATUS FOR OBJECT ORIENTED STORAGE AND RETRIEVAL OF DATA FROM A RELATIONAL DATABASE TO IMPLEMENT A REAL TIME BILLING SYSTEM
15. (WO 98/40805) METHOD OF SYNCHRONIZING INDEPENDENTLY DISTRIBUTED SOFTWARE AND DATABASE SCHEMA

Search Summary

"database table": 33 occurrences in 15 records.

Search Time: 0.22 seconds.

WEST

□ Generate Collection

L4: Entry 4 of 20 File: USPT Feb 13, 2001

US-PAT-NO: 6189010
DOCUMENT-IDENTIFIER: US 6189010 B1

TITLE: Method for repairing constraint violations in a database management system

DATE-ISSUED: February 13, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Isip, Jr.; Amando B.	Richardson	TX	N/A	N/A

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Platinum Technology, Inc.	Oakbrook Terrace	IL	N/A	N/A	02

APPL-NO: 9/ 095449
DATE FILED: June 10, 1998

INT-CL: [7] G06F 17/30
US-CL-ISSUED: 707/100; 707/8
US-CL-CURRENT: 707/100; 707/8
FIELD-OF-SEARCH: 707/3, 707/9, 707/102, 707/100, 707/2, 707/8

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected Search ALL

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
□	4933848	June 1990	Haderle et al.	364/300
□	4947320	August 1990	Crus et al.	364/200
□	5226158	July 1993	Horn et al.	395/600
□	5241648	August 1993	Cheung et al.	395/600
□	5386557	January 1995	Boykin et al.	707/1
□	5513350	April 1996	Griffin et al.	395/702
□	5551029	August 1996	Jagadish et al.	707/103
□	5553218	September 1996	Li et al.	707/102
□	5706494	January 1998	Cochrane et al.	707/2
□	5745896	April 1998	Vijaykumar	707/100
□	5873075	February 1999	Cochrane et al.	707/2
□	5899993	May 1999	Jenkins, Jr.	707/9
□	5950188	September 1999	Wildermuth	707/3
□	5950210	September 1999	Nelson	707/203
□	6065017	May 2000	Barker	707/202

OTHER PUBLICATIONS

Yoon, J.P., et al., "Semantic update optimization in active databases", Database Applications Semantics, Proc. of the IFIP WG 2.6 Working Conf. on DB Appl Semantics, Jun. 1995, pp. 1-26.
Baralis, E. et al., "Declarative specification of constraint maintenance", Entity-Relationship Approach--ER '94, 13th Int'l Conf. on ER Approach Proc., Dec. 1994, pp. 205-222.
Yoon, J.P. et al., "Databases updates using active rules: a unified approach for consistency maintenance", DB Systems for Adv Applications, '93 Proc. 3d Int'l Symp. on DB, 1993, pp. 271-278.

ART-UNIT: 277
PRIMARY-EXAMINER: Homere; Jean R.
ATTY-AGENT-FIRM: Baker & McKenzie

ABSTRACT:

In response to a constraint violation in a row of a database table, an output file is generated including the characteristics of the table containing the row in error as well as an SQL UPDATE statement for the row. The SQL UPDATE statement includes the column values in the row which can be corrected by the user, the user modified SQL UPDATE statement being subsequently executed to repair the constraint violation.

18 Claims, 8 Drawing figures

WEST

□ Generate Collection

L4: Entry 4 of 20 File: USPT Feb 13, 2001

DOCUMENT-IDENTIFIER: US 6189010 B1
TITLE: Method for repairing constraint violations in a database management system

BSPR:
A well known database software program is DATABASE 2 (DB2) database software distributed by IBM Corporation. As is known in the art, DB2 operates as a subsystem in a computer system operating under the IBM MVS operating system software. In a DB2 environment, user data resides in DB2 tables which are in tablespaces. A tablespace is, for example, a portion of storage space in a direct access storage device (DASD) such as a disk drive. For exemplary purposes, illustrated below is an order_entry table that would be stored in a tablespace. The order_entry table contains columns: customer_number; product_code; order_number; buyer_name; and ship_to_zip.

DEPR:
FIG. 5 illustrates exemplary initialization processing of a CHECK utility according to an embodiment of the present invention, such as performed in step 410 of FIG. 4. In step 510, a user of the CHECK utility provides a name of a tablespace which is to be subject to constraint enforcement. For example, the user can input the name of the tablespace via an I/O device such as a keyboard to the computer system operating the database management system and the CHECK utility. In step 520, the CHECK utility identifies the database table located in the tablespace identified by the user, for example by reading the DB2 catalog. Usually, there is only one database table in a tablespace.

WEST

□ Generate Collection

L1: Entry 4 of 47 File: USPT Aug 7, 2001

DOCUMENT-IDENTIFIER: US 6272503 B1
TITLE: Tablespace-relative database pointers

ABPL:
A database containing datafiles is partitioned into a set of tablespaces. Every disk pointer pointing to a data item in a datafile refers to a tablespace-relative file number for the datafile. Data pointed to by a tablespace-relative disk pointer is retrieved by first checking the cache, and upon a cache miss, the tablespace-relative file number is translated into an absolute file number according to a latch-free look up technique.

BSPR:
In accordance with an aspect of the invention, a method of retrieving a data item from a computer database includes partitioning the database into a set of tablespaces and storing references to data items as tablespace-relative pointers, indicating a location relative to the tablespace containing the data item. A data item is retrieved from any one of the datafiles, by reading a tablespace-relative pointer, determining a tablespace identity from an operating context, and locating the data item based on the tablespace-relative pointer and the tablespace identity.

BSPR:
In accordance with another aspect of the invention, a database system comprises a set of datafiles and a set of tablespaces forming a partition of and containing the set of datafiles. Also contained in the set of datafiles is a set of data items. References to the data items are stored in the set of datafiles as tablespace-relative pointers, indicating the location of a corresponding data item relative to the tablespace containing the corresponding data item. In another embodiment, the database system is configured to locate a data item within the set of datafiles by reading a tablespace-relative pointer, determining a tablespace identity from an operating context, and locating the data item based on the tablespace-relative pointer and the tablespace identity.

BSPR:
In accordance with a further aspect of the invention, a computer readable medium has a sequence of instructions for logically partitioning a set of datafiles of a database into a set of tablespaces stored upon it. In another aspect, the computer readable medium has instructions for storing references to data items that are contained in the set of datafiles as tablespace-relative pointers. Each tablespace-relative pointer indicates a location of a corresponding data item relative to the tablespace containing the corresponding data item. In a further aspect, the computer readable medium has instructions for locating a data item within any one of the datafiles by reading a tablespace-relative pointer, determining a tablespace identity from an operating context, and locating a data item based on the tablespace-relative pointer and the tablespace identity.

BSPV:
U.S. patent application Ser. No. 08/852,968 entitled "Pluggable Tablespaces for Database Systems," filed by William H. Bridge, Jr., Jonathan D. Klein, J. William Lee, Juan R. Loaiza, Alex Tsukerman, Gianfranco Putzolu on May 8, 1997, (now U.S. Pat. No. 5,890,167 issued Mar. 30, 1999), incorporated herein by reference; and

DRPR:
FIGS. 12(a), 12(b), and 12(c) are flowcharts illustrating the operation of unplugging a set of tablespaces from a database according to embodiments of the present invention.

DRPR:
FIGS. 13(a), 13(b), and 13(c) are flowcharts illustrating the operation of plugging a set of tablespaces into a database according to embodiments of the present invention.

DEPR:
To increase the addressing range of disk pointers, groups of related datafiles are

collected into tablespaces. A tablespace is a collection of one or more datafiles. Tablespaces function as a unit of object placement, space administration, and point-in-time recovery. Every datafile within a database belongs to exactly one tablespace, and whenever a new datafile is added to a database, it is always added to a specific tablespace. A table or an index may be undivided into smaller units, called partitions. Each partition is stored in the datafiles of a tablespace. Hence, a table or an index may belong to a plurality of tablespaces.

DEPR:
For example, database 200 can be partitioned into six tablespaces as shown in database 400 in FIG. 4. Database 400 comprises six tablespaces, 410 to 420. Datafiles 212 and 214 belong to tablespace 412, and datafiles 216, 218, and 220 belong to tablespace 414. System tablespace 410 comprises data dictionary 240. Control file 242 is kept separate, not part of a tablespace.

DEPR:
When a tablespace is created within a database, it is assigned a tablespace number (TSN), which is unique for that database. The tablespace number is limited to a word size, on a 32-bit machine signifying a theoretical limit of about four billion. Each tablespace are associated with a control list of datafiles, containing a tablespace-relative file number (TRFN) and the corresponding datafile. Thus in FIG. 4, tablespaces 410 to 420 each associated with control lists 430 to 440. In particular, tablespace 412 is associated with control list 432, which has entries indicating that a datafile having TRFN of 1 corresponds to the datafile having an AFN of 2. Likewise, a datafile with a TRFN of 2 corresponds to the datafile with an AFN of 3. Control lists 430 to 440 are actually kept in control file 242 but are depicted in FIG. 4 near the corresponding tablespaces for clarity.

DEPR:
A TRFN is unique among the datafiles of a tablespace, but need not be unique among all the datafiles of a database. In fact, a datafile may have different

DEPR:
The tablespace-relative pointer addressing scheme allows a maximum of 1024 datafiles per tablespace, not database, and over four billion tablespaces per database. As a result, the allowable number of datafiles is no longer limited by the 10-bit absolute file number field in the disk pointer, but by the word size of host computer. In short, the theoretical maximum number of datafiles per database is increased to over four billion datafiles per database.

DEPR:
Tablespace-relative disk pointers also facilitate the transfer of a group of datafiles within a tablespace without having to patch the disk pointers. Tablespace-relative file numbers need not be unique between tablespaces, only within a tablespace. Therefore, plugging a new tablespace into a database does not create any file number conflicts in the disk pointers, allowing the transfer to be made without having to patch the disk pointers.

DEPR:
Translating the TSN:TRFN pair into the proper AFN, however, brings up the issue of concurrency. In a concurrent database, more than one user at a time may simultaneously update the database, possibly adding or removing datafiles from a tablespace. Generally, data structures are protected in a concurrent environment by obtaining a latch for a critical section of processing. A latch in this context is a mutually exclusive lock and may be implemented in a variety of ways known in the art, including but not limited to semaphores.

DEPR:
To facilitate the transfer of a group of datafiles from one database to another, groups of related datafiles are collected into tablespaces. A tablespace is a collection of one or more datafiles. Tablespaces function as a unit of object placement, space administration, and point-in-time recovery. Every datafile within a database belongs to exactly one tablespace, and whenever a new datafile is added to a database, it is always added to a specific tablespace.

DEPR:
For example, database 200 can be partitioned into six tablespaces as shown in database 500 in FIG. 8. Database 500 comprises six tablespaces, 810 to 820. Datafiles 212 and 214 belong to tablespace 812, and datafiles 216, 218, and 220 belong to tablespace 814. System tablespace 810 comprises data dictionary 240 and control file 242.

DEPR:
According to an embodiment of the invention, transferring data between two databases has two phases. In the first phase, a user "unplugs" a set of tablespaces, containing the

desired data, from a source database. Unplugging a set of tablespaces is started by issuing an "unplug" command to a database system, which performs in response the steps shown in FIG. 12(a). At step 1200, the database system gets a specification of the tablespaces to be transferred, called the "pluggable set." Step 1210 receives the name of an export/import file from the user. For example, a user desiring to transfer the data in table 250 and index 260 from database 800 specifies tables 812 in the unplugging operation. With the pluggable set and the name of the export/import file, the source database produces a set of files (steps 1204 and 1206) that the user may then copy to a place accessible to the target database.

DEPR:
According to one embodiment of the invention, the unplug operation in step 1206 removes the set of tablespaces from the source database; however, another embodiment of the invention leaves the set of tablespaces unchanged in the source database. A preferred embodiment of the invention enables both operations. In this situation, the former operation is termed "unplugging" a set of tablespaces, and the latter operation, "copying" a set of tablespaces.

DEPR:
Given a set of unplugged or copied tablespaces, the user may then plug the set of tablespaces into a target database by issuing a plug-in command with the name of export/import file. The metadata is reconstructed from the pluggable set and the plugged-in tablespaces become new tablespaces in the target database.

DEPR:
According to another embodiment, the target database accesses the set of tablespaces without copying the tablespaces. In step 1310, the target system received the pluggable on a computer-readable medium in a drive. After prompting for the name of the export/import file (step 1312) and importing the metadata (step 1314), the target system accesses the tablespaces in the pluggable set directly (step 1316), without patching the disk pointers (step 1318).

DEPR:
In a preferred embodiment, both approaches are permitted according to the presence or absence of a "read-only" option. If the read-only option is not specified, then the tablespaces are copied in; on the other hand, if the read-only option is specified, then the tablespaces are used in the drive directly. The read-only option is useful with plugging in tablespaces published on a CD-ROM, because the target database will use the tablespaces by reading the CD-ROM drive without copying the tablespaces into the target database.

DEPR:
The two difficulties in the prior art due to the internal structure of databases are handled by using tablespace-relative disk pointers to avoid disk pointer patching and by exporting/importing only the metadata associated with the transferred set of tablespaces.

DEPR:
When a tablespace is created within a database, it is assigned a tablespace number (TSN), which is unique for that database. Each tablespace contains a control list of datafiles, containing a tablespace-relative file number (TRFN) and the corresponding datafile. Thus in FIG. 8, tablespaces 810 to 820 each include control lists 830 to 840. In particular, tablespace 812 includes control list 832, which has entries indicating that a datafile having TRFN of I corresponds to the datafile having an AFN of 2. Likewise, a datafile with a TRFN of 2 corresponds to the datafile with an AFN of 3.

DEPR:
A TRFN is unique among the datafiles of a given tablespace, but need not be unique among all the datafiles of a database. In the example of FIG. 8, tablespace 812 has a TSN of 2 and control list 832. Datafile 212 of tablespace 812 has a TRFN of 1 according to control list 832, yet datafile 230 in tablespace 520 also has a TRFN of 1 according to control list 840. Thus, both datafile 812 and datafile 230 have the same TRFN, but they are distinct datafiles. However, the TSNs are different: tablespace 820 has a TSN of 6, and tablespace 812 has a TSN of 2.

DEPR:
Tablespace-relative disk pointers allow datafile disk pointers to be copied without having to be patched. FIG. 9 shows a destination database 900 with two tablespaces, 910 and 912. Tablespace 912 comprises two datafiles, 312 and 314, and control list 932. Datafile 314 is an index, index 360, built on table 350, and contains tablespace-relative disk pointer 980 with a tablespace-relative DBA of 1:300, pointing to data item 970 in table 350. Copying tablespace 812 of database 800 yields database 1000 in FIG. 10(a). Disk pointer 880 maintains the same value, 1:300, but still points to data item 270, even in database 1000. During the plugging in process tablespace 812

is copied or accessed without patching any of its disk pointers in datafile 212 or 214. The administrative information in the control list 832 indicating the mapping between the TRFNs for tablespace 812 is reconstituted as described below. Non-dangling disk pointer 880 has the identical value in database 1000 as in database 800. However, tablespace- relative disk pointer 880 still points to data item 270, because the TSN for disk pointer 980 is 1, and control list 832 maintains that a TRFN of 1 indicates datafile 212. Thus, tablespace-relative disk pointers avoid the aliasing problem associated with the absolute disk pointer technology.

DEPR:
Tablespace-relative disk pointers also remain valid after being transferred to a target database. FIG. 10(b) illustrates the result, database 1002, of plugging tablespace 820 of database 800 into database 900. Tablespace-relative disk pointer 882 contains the same value of source database 800, 1:300. However, disk pointer 882 continues to point to data item 272, because the tablespace relative file number portion of the disk pointer is still valid.

DEPR:
Some objects are related to associated with other objects. For example, indexes are typically associated with tables. An index that is built on a table contains database pointers to that table. As another example, referential integrity constraints can associate with several tables. In addition, all partitions of a table are related to each other. The database system typically keeps track of these relationships in a data dictionary. Therefore, the database system is able to determine whether a set of tablespaces, the "pluggable set," contains pointers outside the pluggable set.

DEPR:
For example, when tablespace 816 as the only tablespace in a pluggable set is unplugged from database 800 of FIG. 8, the database system inspects the objects in the tablespace, table 254 and index 266. Index 266 is built on table 250, which is found in tablespace 812, which is not in the pluggable set. Therefore, the database will drop index 266 from unplugged tablespace 816. Accordingly, when the pluggable set is plugged into database 900 the result is shown in FIG. 10(c), where only table 254 is transferred to database 1004.

DEPR:
In the example, if tablespace 816 is being copies, the database system determines that index 266 may contain pointers outside the pluggable set, because it is built on a table outside of the pluggable set. When the user is prompted, the user may allow index 266 to be dropped from the pluggable set or expand the pluggable set to include tablespace 812, which contains the table, table 250, upon which index 266 was built. In either case, the result is a self-contained pluggable set.

DEPR:
A special case occurs when a data warehouse is periodically refreshed with tablespaces from an OLTP database. In this case, the user should drop the tablespaces in the data warehouse before plugging a more recent version of the pluggable set from the OLTP database into the data warehouse. This procedure avoids a potentially large number of external name conflicts.

DEPR:
The CD-ROM is distributed to the target database by conventional means (e.g., by mail, overnight delivery, file transfer protocol). At the target site, the CD-ROM pluggable set is plugged into a target database, by loading the CD-ROM into a CD-ROM drive of the target computer system. After the set of tablespaces is thus available, the metadata contained on the CD-ROM is imported into the target database. Since the user data of the CD-ROM pluggable set is already in native format, the tablespaces in the pluggable set need not be converted or even copied and may remain in the CD-ROM driver, conserving disk space of the target site.

WEST

□ Generate Collection

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U.S. PATENT DOCUMENTS

Search Selected Search ALL

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
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□	5313625	May 1994	Hess et al.	N/A
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"Recovery Protocol for Nested Transactions Using Write--Ahead logging", IBM.RTM. Technical Disclosure Bulletin, 31(4):2 pages (Sep. 1988).

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ABSTRACT:

The present invention discloses a technique for restoring a database in a computer. In accordance with the present invention, the database contains objects and is stored on a data storage device connected to the computer. After a system failure, a log file is read. The log file contains one or more modifications to the database objects. Each modification has an associated data page and time stamp or sequence number. The modifications are sorted by at least one predefined sorting key value. The sorted modifications are then grouped by database object. The sorted modifications are applied to each database object in parallel.

18 Claims, 6 Drawing figures

WEST

□ Generate Collection

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BSPR:
A common technique for storing a database in a data storage device is to assign each table to a tablespace. A tablespace is a named collection of one or more datasets. Each tablespace is physically divided into equal units called data pages, and each data page contains one or more tuples of data.